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# **Inventor Information for 10/656649**

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| US<br>20060047319<br>A1 | US-<br>PGPUB | 20060302 | 27 | System and method for determining optimal atrioventricular delay based on intrinsic conduction delays                       | 607/9   |         | Bruhns;<br>Ken et al.        |
|-------------------------|--------------|----------|----|---|---------|---------|------------------------------|
| US<br>20050277992<br>A1 | US-<br>PGPUB | 20051215 |    | Collecting and analyzing sensed information as a trend of heart failure progression or regression                           | 607/9   | 600/509 | Koh,<br>Steve et<br>al.      |
| US<br>20050216067<br>A1 | US-<br>PGPUB | 20050929 |    | System and method for predicting a heart condition based on impedance values using an implantable medical device            | 607/17  |         | Min,<br>Xiaoyi et<br>al.     |
| US<br>20050215914<br>A1 | US-<br>PGPUB | 20050929 |    | System and method for evaluating heart failure based on ventricular enddiastolic volume using an implantable medical device | 600/508 |         | Bornzin,<br>Gene A. e<br>al. |
| US<br>20050203603<br>A1 | US-<br>PGPUB | 20050915 |    | Convertible stylet to abet in the implant of a left heart lead  | 607/122 |         | Chitre,<br>Yougandlet al.    |
| US<br>20050149138<br>A1 | US-<br>PGPUB | 20050707 |    | System and method for determining optimal pacing sites based on myocardial activation times                                 | 607/27  |         | Min,<br>Xiaoyi et<br>al.     |
| US<br>20050125041<br>A1 | US-<br>PGPUB | 20050609 |    | Methods for ventricular pacing  | 607/9   |         | Min,<br>Xiaoyi et<br>al.     |

| US<br>20050080471<br>A1 | US-<br>PGPUB | 20050414 | Lead body construction   | 607/122 |         | Chitre,<br>Yougandlet al.        |
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| US<br>20050070965<br>A1 | US-<br>PGPUB | 20050331 | Method and system for discriminating RA driven from LA driven atrial flutter   | 607/9   |         | Kil, Jong<br>et al.              |
| US<br>20050059897<br>A1 | US-<br>PGPUB | 20050317 | Statistical<br>analysis for<br>implantable<br>cardiac devices  | 600/510 |         | Snell,<br>Jeffery D.<br>et al.   |
| US<br>20050055060<br>A1 | US-<br>PGPUB | 20050310 | Determination of respiratory characteristics from AV conduction intervals  | 607/17  |         | Koh,<br>Steve et<br>al.          |
| US<br>20040267321<br>A1 | US-<br>PGPUB | 20041230 | Method and apparatus for monitoring drug effects on cardiac electrical signals using an implantable cardiac stimulation device | 607/3   | 607/9   | Boileau,<br>Peter et al          |
| US<br>20040243210<br>A1 | US-<br>PGPUB | 20041202 | Fixation of a left heart medical lead in the coronary sinus  | 607/122 | 607/125 | Morgan,<br>Kevin L.<br>et al.    |
| US<br>20040199104<br>A1 | US-<br>PGPUB | 20041007 | Apparatus and system for delivery of drug therapies  | 604/65  |         | Ujhelyi,<br>Michael<br>R. et al. |
| US<br>20040064176<br>A1 | US-<br>PGPUB | 20040401 | Electrode for his bundle stimulation   | 607/126 |         | Min,<br>Xiaoyi et<br>al.         |
| US<br>20030233139<br>A1 | US-<br>PGPUB | 20031218 | Technique for fixating a lead  | 607/122 |         | Chitre,<br>Yougandlet al.        |
| US<br>20030195579<br>A1 | US-<br>PGPUB | 20031016 | Automatic capture using independent  | 607/27  |         | Bradley,<br>Kerry et<br>al.      |

|             | <del></del>  | Г — I    | channels in bi-   |        | 1        |   |
|-------------|--------------|----------|-------------------|--------|----------|---|
|             |              |          | chamber           | 1      |          |   |
|             |              |          |                   |        |          |   |
|             | <del> </del> |          | stimulation       | 606/41 | 600/274  | <del>                                      </del> |
| US          | US-          | 20031016 | Ablation catheter | 606/41 | 600/374; | Stewart,  |
| 20030195507 | PGPUB        |          | and method for    |        | 600/381  | Mark T. e   |
| A1          |              |          | isolating a       |        |          | al.   |
|             |              |          | pulmonary vein    |        |          |   |
| US          | US-          | 20031016 | Ablation catheter | 606/41 | 600/374; | Stewart,  |
| 20030195506 | PGPUB        |          | and method for    |        | 600/381  | Mark T. e   |
| A1          |              |          | isolating a       |        |          | al.   |
|             |              |          | pulmonary vein    |        |          |   |
| US          | US-          | 20031009 | Ablation catheter | 606/41 |          | Stewart,  |
| 20030191463 | PGPUB        |          | and method for    |        |          | Mark T. e   |
| Al          |              |          | isolating a       |        |          | al.   |
| ***         |              |          | pulmonary vein    |        | e.       |   |
| US          | US-          | 20030911 | Method and        | 607/19 |          | Florio,   |
| 20030171782 | PGPUB        | 20030711 | apparatus for     | 007,15 |          | Joseph J.   |
| A1          | TOTOD        |          | using a rest mode |        |          | et al.  |
| AI          |              |          | indicator to      | ŀ      |          |   |
|             |              |          | i i               |        |          | ,   |
|             |              |          | automatically     |        | 1        |   |
|             | Ì            |          | adjust control    |        |          |   |
|             |              |          | parameters of an  |        |          |   |
|             |              |          | implantable       |        |          |   |
|             | į            |          | cardiac           | ľ      |          |   |
|             |              | j        | stimulation       |        |          |   |
|             |              |          | device            |        | ļ        | <u> </u>  |
| US          | US-          | 20030911 | Method and        | 607/17 | 607/19   | Florio,   |
| 20030171781 | PGPUB        |          | apparatus for     |        |          | Joseph J.   |
| A1          |              |          | using a rest mode |        |          | et al.  |
|             |              |          | indicator to      |        |          |   |
| ·           |              |          | automatically     |        |          |   |
|             |              |          | adjust control    | Ĭ      |          |   |
|             |              |          | parameters of an  |        |          |   |
|             |              |          | implantable       |        |          |   |
|             |              |          | cardiac           |        |          |   |
|             |              |          | stimulation       |        |          |   |
|             |              |          | device            |        |          |   |
| US          | US-          | 20030828 | Implantable       | 607/5  |          | Bornzin,  |
| 20030163165 | PGPUB        | 20030020 | cardiac           |        |          | Gene A. e   |
| A1          | 10100        |          | stimulation       |        |          | al.   |
| 🔠           |              |          | device that       |        |          |   |
|             |              |          | defibrillates the |        |          |   |
|             |              |          | atria while       |        |          |   |
|             |              |          |                   |        |          |   |
|             |              |          | avoiding the      |        |          |   |
|             |              | 1        | ventricular       |        |          |   |
|             |              |          | vulnerable period |        | _l       |   |

|                         |              |          | and method   |         |                                |
|-------------------------|--------------|----------|--|---------|--------------------------------|
| US<br>20030153956<br>A1 | US-<br>PGPUB | 20030814 | Cardiac stimulation device including sleep apnea prevention and treatment                        | 607/17  | Park,<br>Euljoon e<br>al.      |
| US<br>20030153955<br>A1 | US-<br>PGPUB | 20030814 | Cardiac stimulation device including sleep apnea prevention and treatment                        | 607/17  | Park,<br>Euljoon e<br>al.      |
| US<br>20030153954<br>A1 | US-<br>PGPUB | 20030814 | Sleep apnea<br>therapy device<br>using dynamic<br>overdrive pacing                               | 607/17  | Park,<br>Euljoon ei<br>al.     |
| US<br>20030153953<br>A1 | US-<br>PGPUB | 20030814 | Stimulation<br>device for sleep<br>apnea prevention,<br>detection and<br>treatment               | 607/17  | Park,<br>Euljoon e<br>al.      |
| US<br>20030130704<br>A1 | US-<br>PGPUB | 20030710 | Method and apparatus for dynamically adjusting a non- linear overdrive pacing response function  | 607/11  | Florio,<br>Joseph J.<br>et al. |
| US<br>20030130703<br>A1 | US-<br>PGPUB | 20030710 | Method and apparatus for dynamically adjusting overdrive pacing parameters                       | 607/11  | Florio,<br>Joseph J.<br>et al. |
| US<br>20030083708<br>A1 | US-<br>PGPUB | 20030501 | Implantable cardiac stimulation system and method for automatic capture verification calibration | 607/27  | Bradley,<br>Kerry et<br>al.    |
| US<br>20030074040<br>A1 | US-<br>PGPUB | 20030417 | System, device<br>and method for<br>placing a body   | 607/119 | Florio,<br>Joseph J.<br>et al. |

|                         |              |           | implantable lead<br>in the coronary<br>sinus region of<br>the heart   |         |                             |
|-------------------------|--------------|-----------|---|---------|-----------------------------|
| US<br>20030050681<br>A1 | US-<br>PGPUB | 20030313  | Self-anchoring coronary sinus lead  | 607/125 | Pianca, Anne M. et al.      |
| US<br>20030045910<br>A1 | US-<br>PGPUB | .20030306 | Pacing mode to reduce effects of orthostatic hypotension and syncope  | 607/23  | Sorensen,<br>Chris et al    |
| US<br>20030040778<br>A1 | US-<br>PGPUB | 20030227  | Orientation of patient's position sensor using external field   | 607/17  | Kroll,<br>Mark W.<br>et al. |
| US<br>20030040776<br>A1 | US-<br>PGPUB | 20030227  | Detection of patient's position and activity status using 3D accelerometer-based position sensor  | 607/9   | Kroll,<br>Mark W.<br>et al. |
| US<br>20020147488<br>A1 | US-<br>PGPUB | 20021010  | Body implantable lead with improved tip electrode assembly  | 607/122 | Doan,<br>Phong D.<br>et al. |
| US<br>20020120303<br>A1 | US-<br>PGPUB | 20020829  | Implantable cardiac device providing repetitive non- reentrant ventriculo-atrial synchronous (RNRVAS) rhythm therapy using VA interval extension and method | 607/14  | Levine, Paul A. et al.      |
| US<br>20020120301<br>A1 | US-<br>PGPUB | 20020829  | Implantable cardiac device providing repetitive non- reentrant ventriculo-atrial  | 607/9   | Levine, Paul A. et al.      |

| US<br>20020103524<br>A1  | US-<br>PGPUB | 20020801 | synchronous (RNRVAS) rhythm therapy using secondary pacing pulses and method Implantable cardiac single pass coronary sinus lead for | 607/122 | Bornzin,<br>Gene A. e<br>al.   |
|--------------------------|--------------|----------|--|---------|--------------------------------|
|                          |              |          | providing pacing and defibrillation and method of manufacture  |         |                                |
| US<br>20020103523<br>A1  | US-<br>PGPUB | 20020801 | Implantable cardiac coronary sinus lead having a defibrillation electrode of split configuration and method of manufacture           | 607/122 | Helland,<br>John R. et<br>al.  |
| US<br>20020095190<br>A1  | US-<br>PGPUB | 20020718 | System and method for automating capture verification assessment and pacing threshold assessment using a programmer                  | 607/28  | Bornzin,<br>Gene A. e<br>al.   |
| US<br>.20020022839<br>A1 | US-<br>PGPUB | 20020221 | Ablation catheter and method for isolating a pulmonary vein  | 606/41  | Stewart,<br>Mark T. e<br>al.   |
| US<br>20020004672<br>A1  | US-<br>PGPUB | 20020110 | Implantable cardiac stimulation device with detection and therapy for patients with vasovagal syncope                                | 607/9   | Florio,<br>Joseph J.<br>et al. |
| US<br>20020004671        | US-<br>PGPUB | 20020110 | System and method for  | 607/9   | Bornzin,<br>Gene A. e          |

| Al                      |              |          | preventing sudden heart rate drop using implantable cardiac pacing device                                   |         | al.                            |
|-------------------------|--------------|----------|---|---------|--------------------------------|
| US<br>20020004670<br>A1 | US-<br>PGPUB | 20020110 | Implantable cardiac stimulation device with detection and therapy for patients with vasovagal syncope       | 607/9   | Florio,<br>Joseph J.<br>et al. |
| US<br>20020002389<br>A1 | US-<br>PGPUB | 20020103 | Cardiac stimulation devices and methods for measuring impedances associated with the left side of the heart | 607/8   | Bradley,<br>Kerry et<br>al.    |
| US<br>20010049542<br>A1 | US-<br>PGPUB | 20011206 | System and method for automatically verifying capture during multichamber stimulation                       | 607/28  | Florio,<br>Joseph J.<br>et al. |
| US<br>20010037136<br>A1 | US-<br>PGPUB | 20011101 | Lead with polymeric tubular liner for guidewire and stylet insertion  | 607/122 | Pianca,<br>Anne M.<br>et al.   |
| US<br>20010037135<br>A1 | US-<br>PGPUB | 20011101 | Lead with polymeric tubular liner for guidewire and stylet insertion  | 607/122 | Pianca,<br>Anne M.<br>et al.   |
| US 7006868<br>B2        | USPAT        | 20060228 | Method and apparatus for using a rest mode indicator to automatically                                       | 607/19  | Florio;<br>Joseph J.<br>et al. |

|                  |       |          | adjust control parameters of an implantable cardiac stimulation device   |         |                                |                                |
|------------------|-------|----------|--|---------|--------------------------------|--------------------------------|
| US 6999817<br>B2 | USPAT | 20060214 | Cardiac stimulation device including sleep apnea prevention and treatment  | 607/19  | 607/9                          | Park;<br>Euljoon e<br>al.      |
| US 6990374<br>B1 | USPAT | 20060124 | Methods and apparatus for overdrive pacing heart tissue using an implantable cardiac stimulation device                                      | 607/9   |                                | Florio;<br>Joseph J.<br>et al. |
| US 6988007<br>B1 | USPAT | 20060117 | Single pass<br>telescoping<br>cardiac lead for<br>the left heart   | 607/123 | 600/374;<br>607/125            | Morgan;<br>Kevin L.<br>et al.  |
| US 6973352<br>B1 | USPAT | 20051206 | Steerable cardiac pacing and sensing catheter and guidewire for implanting leads   | 607/122 |                                | Tsutsui;<br>Duane et<br>al.    |
| US 6968232<br>B2 | USPAT | 20051122 | Method and apparatus for using a rest mode indicator to automatically adjust control parameters of an implantable cardiac stimulation device | 607/18  |                                | Florio;<br>Joseph J.<br>et al. |
| US 6949097<br>B2 | USPAT | 20050927 | Ablation catheter<br>and method for<br>isolating a<br>pulmonary vein   | 606/41  | 607/113;<br>607/122;<br>607/99 | Stewart;<br>Mark T. e<br>al.   |
| US 6937900<br>B1 | USPAT | 20050830 | AC/DC multi-<br>axis   | 607/19  | 607/18                         | Pianca;<br>Anne M.             |

|                  |       |          | accelerometer for determining patient activity and body position   |         |                   | et al.                       |
|------------------|-------|----------|--|---------|-------------------|------------------------------|
| US 6937897<br>B2 | USPAT | 20050830 | Electrode for His bundle stimulation   | 607/9   | 607/127           | Min;<br>Xiaoyi et<br>al.     |
| US 6934587<br>B1 | USPAT | 20050823 | System and method for automatic atrial capture detection and atrial pacing threshold determination                                   | 607/28  |                   | Bornzin;<br>Gene A. e<br>al. |
| US 6928324<br>B2 | USPAT | 20050809 | Stimulation device for sleep apnea prevention, detection and treatment   | 607/20  | 607/18;<br>607/42 | Park;<br>Euljoon ei<br>al.   |
| US 6925326<br>B1 | USPAT | 20050802 | Implantable cardiac stimulation system and method for measuring atrioventricular conduction and adjusting atrioventricular hystersis | 600/510 | 607/9             | Levine;<br>Paul A. et<br>al. |
| US 6915164<br>B2 | USPAT | 20050705 | Automatic capture using independent channels in bi- chamber stimulation  | 607/29  |                   | Bradley;<br>Kerry et<br>al.  |
| US 6904321<br>B1 | USPAT | 20050607 | System and method of identifying fusion for dual-chamber automatic capture stimulation device  | 607/27  |                   | Bornzin;<br>Gene A. e<br>al. |
| US 6904320<br>B2 | USPAT | 20050607 | Sleep apnea<br>therapy device<br>using dynamic   | 607/17  |                   | Park;<br>Euljoon ei<br>al.   |

|                  |       |          | overdrive pacing  |         |                                |                                |
|------------------|-------|----------|---|---------|--------------------------------|--------------------------------|
| US 6904317<br>B2 | USPAT | 20050607 | Method and apparatus for dynamically adjusting overdrive pacing parameters  | 607/9   | 607/11                         | Florio;<br>Joseph J.<br>et al. |
| US 6899711<br>B2 | USPAT | 20050531 | Ablation catheter and method for isolating a pulmonary vein   | 606/41  | 607/113;<br>607/122;<br>607/99 | Stewart;<br>Mark T. e<br>al.   |
| US 6889077<br>B2 | USPAT | 20050503 | Implantable cardiac stimulation device that defibrillates the atria while avoiding the ventricular vulnerable period and method | 607/4   | 607/63                         | Bornzin;<br>Gene A. e<br>al.   |
| US 6862471<br>B1 | USPAT | 20050301 | Method and apparatus for blanking T-waves from combipolar atrial cardiac signals based on expected T-wave locations             | 600/509 | 607/9                          | McClure;<br>Kelly H.<br>et al. |
| US 6832112<br>B1 | USPAT | 20041214 | Method of adjusting an AV and/or PV delay to improve hemodynamics and corresponding implantable stimulation device              | 607/9   |                                | Bornzin;<br>Gene A.            |
| US 6804556<br>B1 | USPAT | 20041012 | Methods and apparatus for overdrive pacing heat tissue using an implantable cardiac stimulation                                 | 607/9   |                                | Florio;<br>Joseph J.<br>et al. |

|                  |       |          | device  |         |                                |                               |
|------------------|-------|----------|---|---------|--------------------------------|-------------------------------|
| US 6792318<br>B2 | USPAT | 20040914 | Technique for fixating a lead   | 607/126 |                                | Chitre;<br>Yougandlet al.     |
| US 6792307<br>B1 | USPAT | 20040914 | Implantable cardiac stimulation system and method for measuring atrioventricular conduction and adjusting atrioventricular hysteresis | 607/9   | 600/509                        | Levine;<br>Paul A. et<br>al.  |
| US 6782291<br>B1 | USPAT | 20040824 | Implantable cardiac stimulation device with automatic evoked response sensing electrode configuration selection and method            | 607/28  |                                | Bornzin;<br>Gene A. e<br>al.  |
| US 6773433<br>B2 | USPAT | 20040810 | Ablation catheter and method for isolating a pulmonary vein   | 606/41  | 607/113;<br>607/122;<br>607/99 | Stewart;<br>Mark T. e<br>al.  |
| US 6766203<br>B2 | USPAT | 20040720 | Body implantable lead with improved tip electrode assembly  | 607/122 |                                | Doan;<br>Phong D.<br>et al.   |
| US 6766195<br>B1 | USPAT | 20040720 | Method and apparatus for detecting natural electrical coherence within the heart and for administering therapy based thereon          | 607/14  | 600/515;<br>607/4;<br>607/5    | Bornzin;<br>Gene A. e<br>al.  |
| US 6760619<br>B1 | USPAT | 20040706 | Two lead universal defibrillation,  | 607/4   | 607/123                        | Helland;<br>John R. et<br>al. |

|                  |       |          | pacing and sensing system   | ·       |                               |                               |
|------------------|-------|----------|---|---------|-------------------------------|-------------------------------|
| US 6758854<br>B1 | USPAT | 20040706 | Splittable occlusion balloon sheath and process of use  | 606/194 | 604/101.01                    | Butler;<br>William e<br>al.   |
| US 6748277<br>B1 | USPAT | 20040608 | Medical catheter/lead body design and means of manufacture thereof  | 607/122 |                               | Chitre;<br>Yougandl<br>et al. |
| US 6748268<br>B1 | USPAT | 20040608 | Three lead universal pacing and shocking system   | 607/4   |                               | Helland;<br>John R. et<br>al. |
| US 6748261<br>B1 | USPAT | 20040608 | Implantable cardiac stimulation device for and method of monitoring progression or regression of heart disease by monitoring interchamber conduction delays | 600/510 | 600/509;<br>607/9             | Kroll;<br>Mark W.<br>et al.   |
| US 6745081<br>B1 | USPAT | 20040601 | Coronary Sinus Cardiac Lead For Stimulating and Sensing The Atria of the Right and Left Heart and System  | 607/123 |                               | Helland;<br>John R. et<br>al. |
| US 6741885<br>B1 | USPAT | 20040525 | Implantable cardiac device for managing the progression of heart disease and method   | 600/509 | 600/529;<br>607/19;<br>607/20 | Park;<br>Euljoon e<br>al.     |
| US 6731985<br>B2 | USPAT | 20040504 | Implantable cardiac stimulation system and method for   | 607/28  |                               | Poore;<br>John W. 6<br>al.    |

|                  |       |          | automatic capture verification calibration  |        |         |                                |
|------------------|-------|----------|---|--------|---------|--------------------------------|
| US 6721601<br>B1 | USPAT | 20040413 | System and method for automatic atrial capture detection and atrial pacing threshold determination                  | 607/28 |         | Bornzin;<br>Gene A. e<br>al.   |
| US 6721598<br>B1 | USPAT | 20040413 | Coronary sinus cardiac lead for stimulating and sensing in the right and left heart and system                      | 607/4  | 607/123 | Helland;<br>John R. et<br>al.  |
| US 6711438<br>B1 | USPAT | 20040323 | Method and apparatus for blanking T-waves from combipolar atrial cardiac signals based on expected T-wave locations | 607/9  |         | McClure;<br>Kelly H.<br>et al. |
| US 6701187<br>B1 | USPAT | 20040302 | Implantable cardiac stimulation device and method for prolonging atrial refractoriness                              | 607/14 |         | Bornzin;<br>Gene A. e<br>al.   |
| US 6671553<br>B1 | USPAT | 20031230 | Implantable cardiac lead having terminating connector strain relief and method of manufacture                       | 607/37 | 607/119 | Helland;<br>John R. et<br>al.  |
| US 6662047<br>B2 | USPAT | 20031209 | Pacing mode to reduce effects of orthostatic hypotension and syncope  | 607/18 | 607/23  | Sorensen;<br>Chris et al       |
| US 6658292<br>B2 | USPAT | 20031202 | Detection of patient's position and activity status   | 607/19 |         | Kroll;<br>Mark W.<br>et al.    |

|             |         |          | <del></del>        |         | r       | T          |
|-------------|---------|----------|--------------------|---------|---------|------------|
|             |         |          | using 3D           |         |         |            |
|             |         |          | accelerometer-     |         |         |            |
|             |         |          | based position     |         |         |            |
|             |         |          | sensor             |         |         |            |
| US 6658283  | USPAT   | 20031202 | Implantable        | 600/510 |         | Bornzin;   |
| B1          |         |          | cardiac            |         |         | Gene A. e  |
|             |         |          | stimulation        |         |         | al.        |
|             |         |          | device, system     | ŀ       |         |            |
|             |         |          | and method         |         |         |            |
|             |         |          | which provides     |         |         |            |
|             |         |          | an electrogram     |         |         |            |
|             |         |          | signal having the  |         |         |            |
|             | İ       |          | appearance of a    |         |         |            |
|             |         |          | surface            |         |         |            |
|             |         |          | electrocardiogram  |         |         |            |
| US 6650945  | USPAT   | 20031118 | Implantable        | 607/122 | 607/123 | Helland;   |
| B2          |         |          | cardiac coronary   |         |         | John R. et |
|             |         |          | sinus lead having  |         |         | al.        |
|             | •       |          | a defibrillation   |         |         |            |
|             |         |          | electrode of split |         |         |            |
|             |         |          | configuration and  |         |         |            |
|             |         |          | method of          |         |         |            |
|             |         |          | manufacture        |         |         |            |
| US 6650931  | USPAT   | 20031118 | System and         | 600/510 |         | McClure;   |
| B1          | USFAI   | 20031116 | method of          | 000/310 | 1       | Kelly H.   |
|             |         |          | automatically      |         |         | et al.     |
|             |         |          | determining the    |         |         | Ct al.     |
|             |         |          | onsets and ends    |         |         |            |
|             |         |          | of cardiac events  |         |         | 1 1        |
|             |         | ļ        | and far-field      |         |         |            |
|             |         |          |                    |         |         |            |
| TYO 6645005 | TIODATE | 20021111 | signals            | 607/0   | 607/17  | Floria     |
| US 6647295  | USPAT   | 20031111 | Implantable        | 607/9   | 607/17  | Florio;    |
| B2          |         |          | cardiac            |         |         | Joseph J.  |
|             |         |          | stimulation        |         |         | et al.     |
|             |         |          | device with        |         |         |            |
|             |         |          | detection and      |         | *       |            |
|             |         |          | therapy for        |         |         |            |
|             |         |          | patients with      |         |         |            |
|             |         |          | vasovagal          |         |         |            |
|             |         |          | syncope            |         |         |            |
| US 6640136  | USPAT   | 20031028 | Implantable        | 607/28  |         | Helland;   |
| B1          |         |          | cardiac            |         |         | John R. et |
|             |         |          | stimulation        |         |         | al.        |
|             |         |          | device with        |         |         |            |
|             |         | 1        | automatic          |         |         |            |
|             | l I     |          |                    | ſ       |         |            |

|                  |       |          | selection for<br>avoiding cross-<br>chamber<br>stimulation  |        |        |                                |
|------------------|-------|----------|---|--------|--------|--------------------------------|
| US 6636766<br>B2 | USPAT | 20031021 | System and method for preventing sudden heart rate drop using implantable cardiac pacing device                                     | 607/19 | 607/17 | Bornzin;<br>Gene A. e<br>al.   |
| US 6625493<br>B2 | USPAT | 20030923 | Orientation of patient's position sensor using external field   | 607/17 |        | Kroll;<br>Mark W.<br>et al.    |
| US 6625492<br>B2 | USPAT | 20030923 | Implantable cardiac stimulation device with detection and therapy for patients with vasovagal syncope                               | 607/17 | 607/9  | Florio;<br>Joseph J.<br>et al. |
| US 6625490<br>B1 | USPAT | 20030923 | System and method of automatically adjusting sensing parameters based on temporal measurement of cardiac events                     | 607/9  |        | McClure;<br>Kelly H.<br>et al. |
| US 6618619<br>B1 | USPAT | 20030909 | Method and apparatus for reducing the effect of evoked responses on polarization measurements in an automatic capture pacing system | 607/27 | 607/28 | Florio;<br>Joseph J.<br>et al. |
| US 6606517<br>B1 | USPAT | 20030812 | Methods and apparatus for preventing atrial   | 607/14 |        | Park;<br>Euljoon e             |

| US 6572612       | USPAT | 20030603 | arrhythmias by overdrive pacing and prolonging atrial refractoriness using an implantable cardiac stimulation device Ablation catheter | 606/41 | 607/113;           | Stewart;                       |
|------------------|-------|----------|--|--------|--------------------|--------------------------------|
| B2               | OSITI |          | and method for isolating a pulmonary vein  |        | 607/122;<br>607/99 | Mark T. e al.                  |
| US 6539259<br>B1 | USPAT | 20030325 | System and method of automatically adjusting sensitivity in an implantable cardiac stimulation device                                  | 607/9  | ·                  | Weinberg<br>Lisa P. et<br>al.  |
| US 6519493<br>B1 | USPAT | 20030211 | Methods and apparatus for overdrive pacing heart tissue using an implantable cardiac stimulation device                                | 607/9  |                    | Florio;<br>Joseph J.<br>et al. |
| US 6512953<br>B2 | USPAT |          | System and method for automatically verifying capture during multichamber stimulation  | 607/28 |                    | Florio;<br>Joseph J.<br>et al. |
| US 6510342<br>B1 | USPAT | 20030121 | Methods and apparatus for preventing atrial arrhythmias by overdrive pacing multiple heart tissue sites using an implantable           | 607/15 | 607/14             | Park;<br>Euljoon e<br>al.      |

|                               |                                     |         |         | <del></del>           |
|-------------------------------|-------------------------------------|---------|---------|-----------------------|
|                               | cardiac                             |         |         |                       |
|                               | stimulation                         |         |         |                       |
|                               | device                              |         |         | <del></del>           |
| US 6498949   USPAT   20021224 | I - I                               | 607/14  | 607/9   | Levine;               |
| B2                            | cardiac device                      |         |         | Paul A. et            |
|                               | providing                           | ]       |         | al.                   |
|                               | repetitive non-                     |         |         |                       |
|                               | reentrant                           |         |         |                       |
|                               | ventriculo-atrial                   |         |         |                       |
|                               | synchronous                         |         |         |                       |
|                               | (RNRVAS)                            |         |         |                       |
|                               | rhythm therapy                      |         |         |                       |
|                               | using VA interval                   |         |         |                       |
|                               | extension and                       |         |         |                       |
|                               | method                              | 607/100 |         | <del></del>           |
| US 6490489   USPAT   20021203 |                                     | 607/122 |         | Bornzin;<br>Gene A. e |
| B2                            | cardiac single                      |         |         |                       |
|                               | pass coronary<br>sinus lead for     |         | 1       | al.                   |
|                               |                                     |         |         |                       |
|                               | providing pacing and defibrillation |         |         |                       |
|                               | and denomination and method of      |         |         |                       |
|                               | manufacture                         |         |         |                       |
| US 6477419 USPAT 20021105     | <u> </u>                            | 607/14  | 607/9   | Levine;               |
| US 6477419 USPAT 20021105     | Implantable cardiac device          | 007/14  | 00779   | Paul A. et            |
| B2                            | providing                           |         |         | al.                   |
|                               | repetitive non-                     |         |         | ui.                   |
|                               | reentrant                           |         |         |                       |
|                               | ventriculo-atrial                   |         |         |                       |
|                               | synchronous                         |         |         |                       |
|                               | (RNRVAS)                            |         |         |                       |
|                               | rhythm therapy                      |         | ŀ       |                       |
|                               | using secondary                     |         |         |                       |
|                               | pacing pulses and                   |         |         |                       |
|                               | method                              |         |         |                       |
| US 6466821 USPAT 20021015     | AC/DC multi-                        | 607/18  | 607/19  | Pianca;               |
| B1                            | axis                                |         |         | Anne M.               |
|                               | accelerometer for                   |         |         | et al.                |
|                               | determining                         |         |         |                       |
|                               | patient activity                    |         |         | ,                     |
|                               | and body position                   | 4-5-4   |         |                       |
| US 6459937   USPAT   20021001 | Endocardial                         | 607/126 | 607/119 | Morgan;               |
| B1                            | pacing lead with                    |         |         | Kevin L.              |
|                               | detachable tip                      |         |         | et al.                |
|                               | electrode<br>assembly               |         |         |                       |
| 1 1 1                         |                                     |         |         | l .                   |

| US 6456890<br>B2 | USPAT | 20020924 | Lead with polymeric tubular liner for guidewire and stylet insertion  | 607/122 |                                | Pianca;<br>Anne M.<br>et al.  |
|------------------|-------|----------|---|---------|--------------------------------|-------------------------------|
| US 6456889<br>B2 | USPAT | 20020924 | Lead with polymeric tubular liner for guidewire and stylet insertion  | 607/122 |                                | Pianca;<br>Anne M.<br>et al.  |
| US 6456881<br>B1 | USPAT | 20020924 | System and method of identifying fusion for dual-chamber automatic capture stimulation device   | 607/27  |                                | Bornzin;<br>Gene A. e<br>al.  |
| US 6456880<br>B1 | USPAT | 20020924 | Implantable cardiac stimulation device for and method of monitoring progression or regression of a patient's heart condition by monitoring ventricular repolarization interval dispersion | 607/25  |                                | Park;<br>Euljoon e<br>al.     |
| US 6449509<br>B1 | USPAT | 20020910 | Implantable stimulation device having synchronous sampling for a respiration sensor   | 607/20  | 600/533;<br>600/547;<br>607/17 | Park;<br>Euljoon e<br>al.     |
| US 6430448<br>B1 | USPAT | 20020806 | Stimulating electrode having low polarization and method of making same   | 607/121 | 607/119                        | Chitre;<br>Yougandl<br>et al. |
| US 6430447<br>B1 | USPAT | 20020806 | Stimulating electrode having low polarization   | 607/121 | 427/118;<br>607/119            | Chitre;<br>Yougandhet al.     |

|                  |       |          | and method of making same  |         |                                |                              |
|------------------|-------|----------|--|---------|--------------------------------|------------------------------|
| US 6408210<br>B1 | USPAT | 20020618 | System and method for automatic atrial capture detection and atrial pacing threshold determination | 607/28  |                                | Bornzin;<br>Gene A. e<br>al. |
| US 6405091<br>B1 | USPAT | 20020611 | Lead assembly with masked microdisk tip electrode and monolithic controlled release device         | 607/120 | 607/126                        | Vachon;<br>David J. e<br>al. |
| US 6389316<br>B1 | USPAT | 20020514 | System and method for automatic atrial capture detection and atrial pacing threshold determination | 607/28  | 607/11                         | Bornzin;<br>Gene A. e<br>al. |
| US 6377852<br>B1 | USPAT | 20020423 | Implanatable cardiac stimulation device and method for prolonging atrial refractoriness            | 607/9   |                                | Bornzin;<br>Gene A. e<br>al. |
| US 6351672<br>B1 | USPAT | 20020226 | System and method for modulating the pacing rate based on patient activity and position            | 607/19  | 607/17                         | Park;<br>Euljoon e<br>al.    |
| US 6325797<br>B1 | USPAT | 20011204 | Ablation catheter and method for isolating a pulmonary vein  | 606/41  | 607/113;<br>607/122;<br>607/99 | Stewart;<br>Mark T. e<br>al. |
| US 6321123<br>B1 | USPAT | 20011120 | J-shaped coronary sinus lead   | 607/122 | 600/374                        | Morris;<br>Mary M.<br>et al. |
| US 6295471<br>B1 | USPAT | 20010925 | System and method for automatic atrial   | 607/28  |                                | Bornzin;<br>Gene A. e<br>al. |

|                  |       |          | capture detection<br>and atrial pacing<br>threshold<br>determination   |         |        |                                   |
|------------------|-------|----------|--|---------|--------|-----------------------------------|
| US 6275733<br>B1 | USPAT | 20010814 | Dual sensor rate response pacemaker  | 607/18  | 607/19 | Park;<br>Euljoon ei<br>al.        |
| US 6269264<br>B1 | USPAT | 20010731 | Method for measuring impedance in the body   | 600/547 | 607/28 | Weyant;<br>Robert R.<br>et al.    |
| US 6198973<br>B1 | USPAT | 20010306 | Integrated steroid eluting pacing tip electrode  | 607/120 |        | Doan;<br>Phong et<br>al.          |
| US 6178355<br>B1 | USPAT | 20010123 | Intracardiac defibrillation leads  | 607/122 |        | Williams;<br>Terrell M.<br>et al. |
| US 6175766<br>B1 | USPAT | 20010116 | Cardiac pacemaker autothreshold arrangement and method with reliable capture                                   | 607/28  |        | Bornzin;<br>Gene A. e<br>al.      |
| US 6128534<br>A  | USPAT | 20001003 | Implantable cardiac stimulation device and method for varying pacing parameters to mimic circadian cycles      | 607/17  | 607/25 | Park;<br>Euljoon et<br>al.        |
| US 6122546<br>A  | USPAT | 20000919 | Pacemaker and method of operating same that provides functional atrial cardiac pacing with ventricular support | 607/9   |        | Sholder;<br>Jason A.<br>et al.    |
| US 6058328<br>A  | USPAT | 20000502 | Implantable stimulation device having means for operating in a preemptive                                      | 607/14  |        | Levine;<br>Paul A. et<br>al.      |

|                 |       |          | pacing mode to prevent tachyarrhythmias and method thereof   |         |         |                                   |
|-----------------|-------|----------|--|---------|---------|-----------------------------------|
| US 6044294<br>A | USPAT | 20000328 | Methods and apparatus for measuring impedance in the body  | 600/547 | 607/9   | Mortazavi<br>Said et al.          |
| US 6038472<br>A | USPAT | 20000314 | Implantable defibrillator and lead system  | 607/5   | 607/122 | Williams;<br>Terrell M.<br>et al. |
| US 5991661<br>A | USPAT | 19991123 | System and method for measuring cardiac activity   | 607/19  |         | Park;<br>Euljoon ei<br>al.        |
| US 5891176<br>A | USPAT | 19990406 | System and method for providing hemodynamically optimal pacing   | 607/18  |         | Bornzin;<br>Gene A.               |
| US 5873895<br>A | USPAT | 19990223 | Pacemaker and method of operating same that provides functional atrial cardiac pacing with ventricular support | 607/9   |         | Sholder;<br>Jason A.<br>et al.    |
| US 5871530<br>A | USPAT | 19990216 | Intracardiac defibrillation leads  | 607/122 |         | Williams;<br>Terrell M.<br>et al. |
| US 5836976<br>A | USPAT | 19981117 | Cardioversion<br>energy reduction<br>system  | 607/6   |         | Min;<br>Xiaoyi et<br>al.          |
| US 5814077<br>A | USPAT | 19980929 | Pacemaker and method of operating same that provides functional atrial cardiac pacing with ventricular support | 607/9   |         | Sholder;<br>Jason A.<br>et al.    |
| US 5810739<br>A | USPAT | 19980922 | Methods and apparatus for  | 600/510 |         | Bornzin;<br>Gene A. e             |

| US 5800467      | USPAT | 19980901 | classifying cardiac events with an implantable cardiac device Cardio-  | 607/17  |                                | al. Park;                       |
|-----------------|-------|----------|--|---------|--------------------------------|---------------------------------|
| A               |       |          | synchronous impedance measurement system for an implantable stimulation device   |         |                                | Euljoon ei<br>al.               |
| US 5766229<br>A | USPAT | 19980616 | Capture verification method and apparatus for implantable pacemaker utilizing heart rhythm stability measurements to minimize the likelihood of fusion | 607/28  | 607/16                         | Bornzin;<br>Gene A.             |
| US 5733312<br>A | USPAT | 19980331 | System and method for modulating the output of an implantable medical device in response to circadian variations                                       | 607/17  |                                | Schloss;<br>Harold C.<br>et al. |
| US 5718242<br>A | USPAT | 19980217 | Cardiac arrhythmia detection system for an implantable stimulation device and method   | 600/515 | 600/518;<br>600/521;<br>607/14 | McClure;<br>Kelly H.<br>et al.  |
| US 5713924<br>A | USPAT | 19980203 | Defibrillation<br>threshold<br>reduction system  | 607/4   |                                | Min;<br>Xiaoyi et               |
| US 5697956      | USPAT | 19971216 | Implantable  | 607/28  |                                | Bornzin;                        |

| A               |       |          | stimulation device having means for optimizing current drain   |         |                     | Gene A.                        |
|-----------------|-------|----------|--|---------|---------------------|--------------------------------|
| US 5690686<br>A | USPAT | 19971125 | Atrial defibrillation method   | 607/5   |                     | Min;<br>Xiaoyi et<br>al.       |
| US 5674274<br>A | USPAT | 19971007 | Implantable adjustable single- pass A-V lead for use with an implantable stimulation device                          | 607/123 | 607/122             | Morgan;<br>Kevin L.<br>et al.  |
| US 5643338<br>A | USPAT | 19970701 | Single-pass A-V lead for pacing with stimulation of right ventricular outflow tract                                  | 607/123 | 607/125             | Bornzin;<br>Gene A. e<br>al.   |
| US 5628779<br>A | USPAT | 19970513 | Single-pass A-V pacing lead  | 607/123 | 607/125             | Bornzin;<br>Gene A. e<br>al.   |
| US 5560369<br>A | USPAT | 19961001 | Cardiac arrhythmia detection system for an implantable stimulation device and method                                 | 600/518 | 600/517;<br>600/521 | McClure;<br>Kelly H.<br>et al. |
| US 5549650<br>A | USPAT | 19960827 | System and method for providing hemodynamically optimal pacing therapy   | 607/24  | 607/25              | Bornzin;<br>Gene A. e<br>al.   |
| US 5549649<br>A | USPAT | 19960827 | Programmable pacemaker including an atrial rate filter for deriving a filtered atrial rate used for switching pacing | 607/15  |                     | Florio;<br>Joseph J.<br>et al. |

| 1               |       |          | modes   |         |                     |                                  |
|-----------------|-------|----------|---|---------|---------------------|----------------------------------|
| US 5549642<br>A | USPAT | 19960827 | Atrial defibrillator and method of use  | 607/5   |                     | Min;<br>Xiaoyi et<br>al.         |
| US 5540725<br>A | USPAT | 19960730 | Upper rate response for implantable pacemaker based on atrial lock interval pacing  | 607/9   |                     | Bornzin;<br>Gene A. e<br>al.     |
| US 5514162<br>A | USPAT | 19960507 | System and method for automatically determining the slope of a transfer function for a rate-responsive cardiac pacemaker        | 607/19  |                     | Bornzin;<br>Gene A. e<br>al.     |
| US 5513644<br>A | USPAT | 19960507 | Cardiac arrhythmia detection system for an implantable stimulation device   | 600/521 | 128/901             | McClure;<br>Kelly H.<br>et al.   |
| US 5509926<br>A | USPAT | 19960423 | Implantable medical device having means for suppressing thermally induced signals from piezoelectric sensors and method thereof | 607/19  | ·                   | Mortazavi<br>Said et al.         |
| US 5476483<br>A | USPAT | 19951219 | System and method for modulating the base rate during sleep for a rateresponsive cardiac pacemaker                              | 607/17  |                     | Bornzin; Gene A. e al.           |
| US 4941475<br>A | USPAT | 19900717 | Thermodilution by heat exchange   | 600/505 | 600/526;<br>600/549 | Williams;<br>Wilbur R.<br>et al. |

| US 4813421<br>A | USPAT | 19890321 |   | Oxygen sensing pacemaker  | 600/333 | 356/41;<br>607/22   | Baudino;<br>Michael<br>D. et al. |
|-----------------|-------|----------|---|---|---------|---|----------------------------------|
| US 4807629<br>A | USPAT | 19890228 |   | Oxygen sensing pacemaker  | 607/22  | 600/333;<br>600/510   | Baudino;<br>Michael<br>D. et al. |
| US 4791935<br>A | USPAT | 19881220 |   | Oxygen sensing pacemaker  | 600/333 | 600/505   | Baudino;<br>Michael<br>D. et al. |
| US 4725128<br>A | USPAT | 19880216 |   | Method for delivering light from multiple light emitting diodes over a single optical fiber | 385/91  | 156/60;<br>156/64;<br>257/100;<br>257/89;<br>257/98;<br>257/99;<br>385/90 | Bornzin;<br>Gene A. e<br>al.     |
| US H000356<br>H | USPAT | 19871103 | 7 | Epicardial lead having low threshold, low polarization myocardial electrode                 | 607/126 | 604/20;<br>607/122  | Stokes;<br>Kenneth<br>B. et al.  |
| US 4502492<br>A | USPAT | 19850305 |   | Low-polarization low-threshold electrode  | 607/121 | 607/126   | Bornzin;<br>Gene A.              |
| US 4499907<br>A | USPAT | 19850219 |   | Energy limiting cardioversion lead  | 607/122 |   | Kallok;<br>Michael J<br>et al.   |
| US 4467807<br>A | USPAT | 19840828 |   | Rate adaptive demand pacemaker  | 607/22  |   |                                  |

Bornzin; Gene A.

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